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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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10 014 479

EXAMINER

ART UNIT

PAPER NUMBER

DATE MAILED:

This is a communication from the examiner in charge of this application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

**NOTICE OF ALLOWABILITY**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

☒ This communication is responsive to the amendment of 1-28-04  
☒ The allowed claim(s) is/are 1-12

☐ The drawings filed on \_\_\_\_\_ are acceptable as formal drawings.

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

☐ All ☐ Some\* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION.** ~~This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.106(a).~~

☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

☐ Applicant MUST submit NEW FORMAL DRAWINGS

☐ because the originally filed drawings were declared by applicant to be informal.

☐ including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. \_\_\_\_\_

☐ including changes required by the proposed drawing correction filed on \_\_\_\_\_, which has been approved by the examiner.

☐ including changes required by the attached Examiner's Amendment/Comment or in the Office action of Paper No. \_\_\_\_\_

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings.

☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this notice should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

**Attachment(s)**

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

☐ Interview Summary, PTO-413

☐ Examiner's Amendment/Comment

☐ Examiner's Comment Regarding Requirement for the Deposit of Biological Material

☒ Examiner's Statement of Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

Claims 1-~~1~~2 are allowable over Sircar '143 or Erickson '668 in view of Keefer '903, for the reasons presented by applicant in the amendment filed January 28, 2004.

Kobayashi (U.S. Patent 6,113,874) discloses a furnace having at least two regenerator beds for heat recovery. While a first bed is being heated by hot flue gases produced by combusting a fuel and an oxidant in the furnace, a second bed, heated during a previous cycle, is cooled through carrying out an endothermic chemical reaction therein, for example the reforming reaction of a hydrocarbon with water vapor. Once the second bed is cooled by the endothermic reaction, the hot flue gases are redirected to it while the first bed, now hot, is used for carrying out the endothermic chemical reaction. (See the Abstract and column 2, lines 24-43.) Kobayashi '874 teaches at column 4, lines 25-39 that the product of the steam reforming reaction is carbon monoxide and hydrogen, known as synthesis gas, which "can be used further". In a preferred embodiment of the invention the synthesis gas is passed into the furnace and combusted with oxygen to produce carbon dioxide and water. Bucci et al. (U.S. Patent 6,379,645) establishes that it is well known to recover hydrogen from the synthesis gas formed by the steam

reforming of hydrocarbons by pressure swing adsorption. (See column 1, line 14 - column 2, line 57.) Accordingly it would be prima facie obvious from Bucci et al. to recover hydrogen from the synthesis gas formed in the process of Kobayashi '874, since Kobayashi '874 teaches at column 4, lines 32-34 that the synthesis gas "can be used further", and Bucci et al. establish the conventionality of recovering hydrogen from such synthesis gas by pressure swing adsorption. However applicant's claims require the steps of combusting the desorbed gas species from the adsorbent with oxidant to produce hot combustion gas, and passing the hot combustion gas through the cooled regenerative reactor bed to produce cooled combustion gas and a heated regenerative reactor bed. Although Pinto (U.S. Patent 4,778,670) discloses that waste gas from a pressure swing adsorber used to recover hydrogen may be combusted to provide heat, there is no teaching, disclosure or suggestion in the references to pass the hot combustion gas through the cooled regenerative reactor bed of Kobayashi '874 to produce cooled combustion gas and a heated regenerative reactor bed, as required by applicant's claims. Nor would there be any motivation from the prior art to do so.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne A. Langel whose telephone number is (571) 272-1353. The examiner can normally be reached on Monday through Friday from 8 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (571) 272-1358. The fax phone number for this Group is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or public PAIR. Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WAL:cdc

Serial No. 10/014,479

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April 14, 2004

*Wayne A. Langel*  
WAYNE A. LANGEL  
PRIMARY EXAMINER